Understanding The Causes And Consequences Of High-Carotene Cassava Roots

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A large dataset (2129 data points) was developed over the years of research to increase carotenoids content in cassava roots. Correlations were always based on more than 550 data points. Correlations between dry matter content (DMC) and total carotene content (TCC) or β-carotene (TBC) were positive and weak (0.13 and 0.07, respectively). There is no problem, therefore, for producing biofortified cassava with adequate levels of DMC. Correlation between cyanogenic potential (HCN) and TCC was negative suggesting that it is possible to obtain high-carotene with low HCN values. Correlations of data from spectrophotometer and HPLC were very high. TCC and TBC had a high correlation (0.90) suggesting that most carotenoids in cassava roots are β-carotene. Correlations between TCC and TBC with phytoene were relatively high (0.52 and 0.61, respectively). Correlations between TCC and TBC with phytofluene were 0.60 and 0.65, respectively. Correlation between phytoene and phytofluene was 0.96. No case where accumulation of phytoene or phytofluene without parallel levels of carotenoids was observed. Similarly there was no accumulation of phytoene without parallel levels of phtytofluene. There is no evidence, therefore, that accumulation of carotenoids in cassava roots is related to a blockage at the PSY or PDS steps in the carotenoids biosynthesis.